Citation:

Cope MB, Erdman JW Jr, Allison DB. The potential role of soyfoods in weight and adiposity reduction: an evidence-based review. *Obes Rev.* 2008 May;9(3):219-35.

PubMed ID: 18419671

Study Design:

Systematic Review

Class:

M - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To identify and evaluate evidence for or against four propositions related to soyfoods and weight loss:

- Certain soyfoods will improve weight and/or fat loss when fed at isocaloric levels
- Certain soyfoods will improve weight and fat loss when included as part of a diet by affecting caloric intake
- Certain soyfoods will prevent/improve risk factors related to glucoregulatory function and cardiovascular health during weight loss
- Certain soyfoods will minimize the loss of bone mass during weight loss

Inclusion Criteria:

- Literature that provided scientific evidence, including *in vitro,* animal, epidemiologic and clinical studies, either supporting or refuting 4 propositions about soy/weight loss and the related health benefits.

Exclusion Criteria:

None specified.

Description of Study Protocol:

Literature Search:

- Search engines used: PubMed; ISI Web of Science
- Keywords (combinations): soy, weight loss, fat loss, cholesterol, cardiovascular, glucose, LDL, HDL, bone, osteoporosis, isoflavone

Design: Systematic, evidence-based review

Blinding used (if applicable): not applicable

Intervention (if applicable): not applicable

Statistical Analysis: not completed

Data Collection Summary:

Timing of Measurements: not applicable

Dependent Variables

- Weight loss
- Fat loss
- Risk factors related to glucoregulatory function and cardiovascular health during weight loss:
  - indices of glucose metabolism
  - LDL-Cholesterol (LDL-C)
  - HDL-Cholesterol (HDL-C)
  - triglycerides (TG)
- Bone loss

Independent Variables

- Soy intake

Control Variables

- Proposition 1 related to studies where certain soyfoods were fed at prescribed isocaloric levels.

Description of Actual Data Sample:

Initial N:

- Pub Med: 211
- ISI Web of Science: 12 that were different from the 211 identified by PubMed

Attrition (final N): as above

Age: not mentioned

Ethnicity: not mentioned

Other relevant demographics

Anthropometrics

Location: International studies

Summary of Results:

Key Findings

- Certain soyfoods will improve weight and/or fat loss when fed at isocaloric levels; generally supportive evidence in animal studies, but there is no compelling support in human studies.
- Certain soyfoods will improve weight and fat loss when included as a part of a diet by affecting caloric intake; limited supportive evidence in animal and human studies.
- Certain soyfoods will prevent/improve risk factors related to glucoregulatory function and cardiovascular health during weight loss; some evidence supporting this, but additional evidence is needed before conclusions can be made.
- Certain soyfoods will minimize the loss of bone mass during weight loss; no data available pertinent to this proposition.

Proposition 1: Certain soyfoods will improve weight and fat loss when fed at prescribed isocaloric levels (i.e.the two diets contain the same total energy)

- *In vitro* studies provide limited support
- Animal studies are generally supportive compared with casein; the magnitude of effect varied among studies
- Epidemiologic studies provide limited data: several studies with inverse associations (i.e. higher soy consumption associated with lower weight.
    - self-reporting identified as a limitation of these observational studies
- Clinical studies provide no compelling support
    - soy was equivalent to other protein sources during low calorie intake

Proposition 2: Certain soyfoods will improve weight and fat loss when included as part of a diet by affecting caloric intake

- *In vitro* studies: Not applicable
- Animal studies provide limited support - only one study identified that suggested that soy protein, along with other protein sources, may reduce short-term caloric intake in animals
- Epidemiologic studies provide no compelling support
    - one report showed equivalent caloric intake among people consuming higher and lower amounts of soy
- Clinical studies provide limited support for short-term effects; no data for long-term effects

Proposition 3: Soy will prevent/improve risk factors related to glucoregulatory function and cardiovascular health during weight loss

a. Soy will improve indices of glucose metabolism

- *In vitro* studies provide limited support
    - genistein may improve glucose metabolism
- Animal studies provide limited support
    - two studies identified soy to be more beneficial than casein
- Epidemiologic studies provide no compelling support
- Clinical studies provide no compelling support when controlling for weight loss

b. Soy will decrease LDL cholesterol levels

- *In vitro* studies: Not applicable

- Animal studies provide some support
- Epidemiologic studies provide limited support
- Clinical studies provide some support
    - two studies indicated that soy increased HDL levels in postmenopausal women

c. Soy will increase HDL cholesterol levels

- *In vitro* studies: Not applicable
- Animal studies: Limited data
- Epidemiologic studies provide limited support
    - one report indicated that genistein consumption positively associated with increased HDL
- Clinical studies provide some support
    - two studies indicated that soy increased HDL levels in postmenopausal women

d. Soy will decrease triglycerides

- *In vitro* studies: Not applicable
- Animal studies: Generally supportive
- Epidemiologic studies: Limited data
- Clinical studies: Generally supportive

Proposition 4: Soy will minimize the loss of bone mass during weight loss

- *In vitro* studies: Not applicable
- Animal studies: Limited support
- Epidemiologic studies: No available data during weight loss
- Clinical studies: No available data during weight loss

Author Conclusion:

Current data suggest that soyfoods are as good as other protein sources for promoting weight loss and there is a suggestive body of evidence that soyfoods may confer additional benefits, but results must be carefully interpreted and additional evidence is needed before making firm conclusions concerning soyfoods and weight loss.

Reviewer Comments:

It is unclear if the studies that are summarized are the only ones used to draw conclusions or how many studies were included in the final review. Authors note that soyfood nomenclature is not standardized which makes it challenging to compare soy components across studies, and most of the animal and clinical studies use different formulations of soy products and compare soy protein with milk protein sources.

Research Design and Implementation Criteria Checklist: Review Articles

Relevance Questions

1.	Will the answer if true, have a direct bearing on the health of patients?	Yes

2.	Is the outcome or topic something that patients/clients/population groups would care about?	Yes
3.	Is the problem addressed in the review one that is relevant to nutrition or dietetics practice?	Yes
4.	Will the information, if true, require a change in practice?	Yes

Validity Questions

1.	Was the question for the review clearly focused and appropriate?	Yes
2.	Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search termsused described?	Yes
3.	Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased?	Yes
4.	Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible?	No
5.	Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined?	N/A
6.	Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?	Yes
7.	Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issued considered? If data from studies were aggregated for meta-analysis, was the procedure described?	Yes
8.	Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?	Yes
9.	Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?	Yes
10.	Was bias due to the review's funding or sponsorship unlikely?	Yes